

5/15/09 Honors**Multiple Choice***Identify the choice that best completes the statement or answers the question.*B

1. Find the missing value to complete the square.

$x^2 + 14x + \underline{\hspace{2cm}}$

- a. 2,401 b. 49 c. 14 d. 196

Rewrite the equation in vertex form.B

- 2.
- $y = x^2 - 12x + 31$

- a.
- $y = (x - 12)^2 + 37$
- c.
- $y = (x - 12)^2 - 5$
-
- b.
- $y = (x - 6)^2 - 5$
- d.
- $y = (x - 6)^2 + 67$

Simplify the expression.C

- 3.
- $(-3)^{-3}$

- a. 9 b. -27 c.
- $-\frac{1}{27}$
- d.
- $\frac{1}{27}$

C

4. Find the zeros of
- $y = x(x - 4)(x - 2)$
- .

- a. 0, -4, -2 c. 0, 4, 2
-
- b. 4, 2 d. 4, 2, -4

C

5. Write a polynomial function in standard form with zeros at -1, -2, and 5.

- a.
- $f(x) = x^3 - 2x^2 - 13x - 9$
- c.
- $f(x) = x^3 - 2x^2 - 13x - 10$
-
- b.
- $f(x) = x^3 - 10x^2 - 2x - 13$
- d.
- $f(x) = x^3 - 3x^2 + 30x - 9$

B

6. An initial population of 325 quail increases at an annual rate of 26%. Write an exponential function to model the quail population.

- a.
- $f(x) = (325 \cdot 0.26)^x$
- c.
- $f(x) = 325(26)^x$
-
- b.
- $f(x) = 325(1.26)^x$
- d.
- $f(x) = 325(0.26)^x$

Write the expression as a single logarithm.D

- 7.
- $4 \log x - 6 \log (x + 2)$

- a.
- $24 \log \frac{x}{x+2}$
- c.
- $\log x(x + 2)^{24}$
-
- b.
- $\log x^4(x + 2)^6$
- d. none of these

A

8. Solve
- $3 \log 2x = 4$
- . Round to the nearest ten-thousandth.

- a. 10.7722 b. 5 c. 2.7826 d. 0.6309

C 9. Solve $\frac{1}{16} = 64^{4x-3}$.

a. $\frac{1}{12}$

b. $\frac{1}{4}$

c. $\frac{7}{12}$

d. $\frac{11}{12}$

Use natural logarithms to solve the equation. Round to the nearest thousandth.

C 10. $e^{2x} = 1.4$

a. -1.664

b. 0.073

c. 0.168

d. 0.190

C 11. Write an equation for the translation of $y = \frac{4}{x}$ that has the asymptotes $x = 7$ and $y = 6$.

a. $y = \frac{4}{x-6} + 7$

c. $y = \frac{4}{x-7} + 6$

b. $y = \frac{4}{x+7} + 6$

d. $y = \frac{4}{x+6} + 7$

Find any points of discontinuity for the rational function.

C 12. $y = \frac{x-8}{x^2+6x-7}$

a. $x = 1, x = 7$

c. $x = 1, x = -7$

b. $x = 8$

d. $x = -1, x = 7$

Multiply or divide. State any restrictions on the variables.

D 13. $\frac{x+2}{x-1} \div \frac{x+4}{x^2+4x-5}$

a. $\frac{(x+2)(x+5)}{x+4}, x \neq -5, -4$

c. $\frac{(x+2)(x+4)}{(x-1)^2(x+5)}, x \neq 1, -5, -4$

b. $\frac{(x+2)(x+4)}{(x-1)^2(x+5)}, x \neq 1, -5$

d. $\frac{(x+2)(x+5)}{x+4}, x \neq 1, -4$

Add or subtract. Simplify if possible.

A 14. $\frac{a^2-2a-3}{a^2-9a+18} - \frac{a^2-5a-6}{a^2+9a+8}$

a. $\frac{21a-28}{(a-6)(a+8)}$

c. $\frac{-3a+44}{(a-6)(a+8)}$

b. $\frac{2a^2-28}{(a-6)(a+8)}$

d. $\frac{2a^2+18a+44}{2a^2+44}$

Name: _____

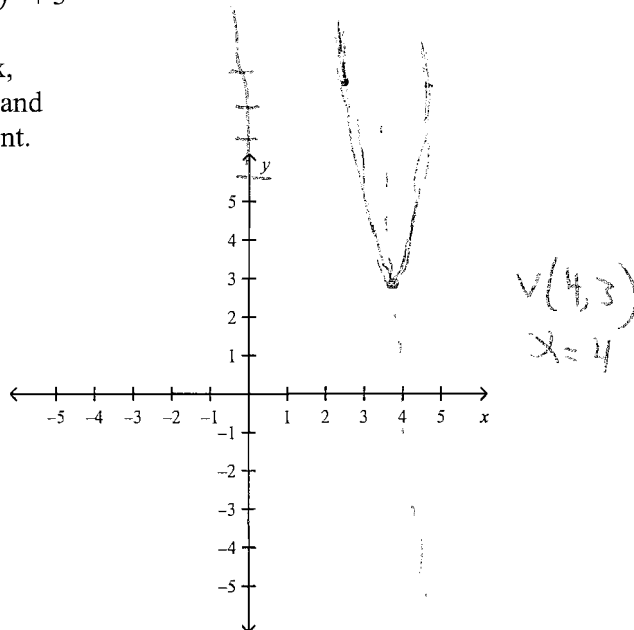
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Completion

Complete each statement.

15. Graph $y = 6(x-4)^2 + 3$

Identify the vertex,
axis of symmetry and
one additional point.



Short Answer

16. Is the relation $\{(2, -1), (-3, 0), (3, -3), (1, 5), (-4, -1)\}$ a function? Explain. *yes*

17. Without graphing, determine whether the function $y = 6(1.62)^x$ represents exponential growth or exponential decay. *b > 1*

18. through $(2, -2)$ and perpendicular to $y = -\frac{1}{3}x + 3$.

$$-2 = -\frac{1}{3}(2) + b$$

$$-2 = -\frac{2}{3} + b$$

$$b = -\frac{4}{3}$$

$$y = -\frac{4}{3}x - \frac{2}{3}$$

Graph the inequality.

19. $x + 2y > -7$

$$2y > -x - 7$$

$$y > -\frac{1}{2}x - \frac{7}{2}$$

Sketch the asymptotes and graph the function.

20. $y = \frac{2}{x+2} - 3$

Solve the equation.

21. $-2x^2 - 5x + 9 = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{5 \pm \sqrt{25 - 4(-2)(9)}}{-4}$$

$$x = \frac{5 \pm \sqrt{97}}{-4}$$

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22. Suppose you invest \$1700 at an annual interest rate of 5.2% compounded continuously. How much will you have in the account after 3 years?

Essay

$$A = Pe^{rt} \quad A = 1700 e^{(0.052)(3)} = \$1,987$$

23. A model for the height of a toy rocket shot from a platform is $y = -16x^2 + 80x + 2$, where x is the time in seconds and y is the height in feet.

a. Find the zeros of the function.

$$-0.02, 5.02$$

b. About how high does the rocket fly before hitting the ground? Explain.

$$h = \frac{b^2}{4a}$$

$$102.92$$